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CHILD HEALTH TRACKING USING SENSORS

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Abstract: **Child health care is one of the most important factor for growth and development of the child. So for proper growth and development monitoring of child health is an important aspect considering growth and development , safety of child has been a critical issue. So we are going to design a framework in which we are going to use microcontroller which is interfaced with temperature sensor , pulse rate sensor, blood pressure and GPS technology.**

Keywords: *IoT Embedded System, Java, MySQL, Eclipse*.

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I INTRODUCTION

Child Tracking System (CTS) is an observing instrument expected for the care-taking grown-ups' use. It is made out of two units; one that is conveyed by the youngster and a moment one working as a supervision unit (like customer/server relationship). The "unit" can be an assortment of gadgets including, yet not constrained to, mobile phones, PDAs and so forth. Equipment unit will speak with administrator through IOT application. Director will keep a record of youngsters about their status like position and wellbeing condition. Thus, administrator can comprehend that their youngster left the normal way or position. Additionally strength of the kid can be screen persistently. Child medicinal services checking utilizing sensor innovation gives the very extraordinary and adaptable answer for conquer the reasons for wellbeing observing. It will lessen the issues identified with soundness of Childs(students).This system is given to a school association to screen the kid's physical condition (Heartbeat and Body temperature) can be detected utilizing sensors. The point of this venture is to give the data about child's wellbeing (heart rate and body temperature) observing through SMS (Short Messaging Service) and web application to a parent and related educator and related people who deals with child(student). This system gives the wellbeing related data to an approved parent anyplace between school times utilizing the web application. It will give programmed observing support of a parent by chance. This system requires a web association with get to the data of child by parent. By utilizing this structure the reasons for wellbeing checking that are effectively treated or averted and it will likewise expand the execution of the child's.

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Emotion is a subjective ordeal of delayed sentiments. The term 'emotion' has been gotten from the Latin word "emovere" which - signifies 'to move", 'to energize', 'to stirrup', or 'to disturb'. Excitement conduct is emotion, which is an influence loaded condition of the living being. When we say that we cherish, dread, and abhor. A portion of alternate emotions are happiness, acknowledgment, astound, bitterness, outrage, and sicken and so on emotion is frequently characterized as an unpredictable condition of emotion that outcomes in physical and mental changes that impact thought and conduct. Emotionality is related with a scope of mental wonders including demeanor, identity, disposition and inspiration. As indicated by creator David G. Meyers, human emotion includes "...physiological excitement, expressive practices, and cognizant experience." Emotion is an intense aggravation of the life form all in all, mental birthplace including conduct, cognizant encounters, and instinctive working. In emotion, the aggregate conduct including the receptors, effectors sensory systems, and related mental procedures is influenced. The real hypotheses of emotion can be assembled into three principle classes: physiological, neurological, and psychological. Physiological speculations recommend that reactions inside the body are in charge of emotions.

Neurological speculations recommend that action inside the mind prompts enthusiastic reactions. At last, psychological hypotheses contend that contemplations and other mental action assume a basic part in the development of emotions.

II GOALS AND OBJECTIVES

This sensor system for Child's health monitoring consists of three main objectives:

1. This sensor systems for Child's health monitoring consist of three main objectives:
2. Sensing and data collection hardware to collect physiological and movement data
3. Communication hardware and software to relay data to a sensor centre.

a) Data analysis techniques to extract clinically-relevant information from physiological and movement data. Recent advances in sensor technology.

b) EEG signals to detect emotions of child weather he/she is either happy or sad.

III PROBLEM STATEMENT

To develop a system which continuously monitor the health of the child with the help of multiple sensors. If anything related to health exceed the specific limit then the system will send a message to the registered number. It also sends location of the child. Further to check emotions of child EEG signals are used.

IV LITERATURE SURVEY

1) Child Health Monitoring Using Sensor Technology is a framework to support a unique health care for children. Using this framework the parents and other related persons who take care the child's and keep intense monitoring on the children's physical health condition from anywhere. This framework also can be used to reduce or prevent things that can be harmful for children's health, grow, and development progress. The CHC (Child Health Care) will be provides many features and such as notification and monitoring system to a professional health care of school as well as parent, based on the children (student) record. This framework will improve the children's health, grow and development progress.

2) Child health care requires intensive and careful attention. It is associated with limited capabilities of a child, especially a child with special condition, such as baby, toddler, and sick child, that has many limitation capabilities to communicate, to move, and to think. Moreover, children also has susceptible immunity system. The lack of care and monitoring health care for children can be caused by busy parents, the lack of parent's knowledge about health care, the lack of parent's awareness to monitor a child's health, that eventually can be some cause of disruption in children growth and development and health care process. This paper proposes a holistic health care framework that can be set according to child's condition and enable to distribute information accurately, directly to parents, person who take care the child, and pediatrician or hospital. Health care's reminder and information dissemination system will be directly sent to parent's or nanny's smartphone. A single click concept also enables parents to call pediatrician or hospital immediately in an emergency condition. All of child's daily data, included food, activity, medicine, and their treatment, will be recorded as an Electronic Medical Record (EMR) and displayed as a chart, to simplify parent and pediatrician in monitoring child's health condition. At the end, the use of this holistic framework also prevent the child from many harmful condition for their health, such as drugs complication, error on diet and activity, inaccuracy of health care needed.

3) Wireless sensor network (WSN) technologies are considered one of the key research areas in computer science and the healthcare application industries for improving the quality of life. The purpose of this paper is to provide a snapshot of current developments and future direction of research on wearable and implantable body area network systems for continuous monitoring of patients. This paper explains the important role of body sensor networks in medicine to minimize the need for caregivers and help the chronically ill and elderly people live an independent life, besides providing people with quality care. The paper provides several examples of state of the art technology together with the design considerations like unobtrusiveness, scalability, energy efficiency, security and also provides a comprehensive analysis of the various benefits and drawbacks of these systems. Although offering significant benefits, the field of wearable and implantable body sensor networks still faces major challenges and open research problems which are investigated and covered, along with some proposed solutions.

4) Emotions play an important role in everyone's life. The brain waves tell us the difference in the emotions the person is going through. This research studies the alfa brain waves in happy and sad emotion. For doing the research EEG machine is used and to elicit the happy and sad emotion move clips are used. The result show there is difference in the Alfa waves in happy and sad emotions.

V SYSTEM ARCHITECTURE

The above figure shows architecture of Child Health Tracking system Using Sensors. In this architecture, there are four sensors are used. These sensors are connected to micro controller. All these sensors sense the health information about child automatically and send that information to micro controller. Micro controller sends that information to the

server, server will check that information of that child & check if it is harmful or not. If it is harmful to a child then it will send notification/reminder to its parent as well as person who take care of child and standard EEG(Electroencephalography) signals are stored in database to detect the emotions of child by comparing real time samples along with this information, location of the child is also recognized through GPS(Global Positioning System). Following are the description about all the blocks in above architecture.

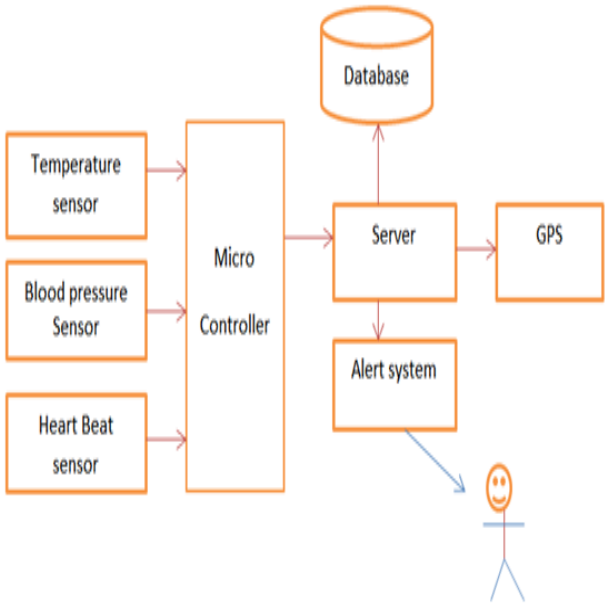

Figure 1 : System Architecture

Temperature Sensor:

A temperature sensor is a device which is designed specifically to measure the hotness or coldness of an object.LM35 is a precision IC temperature sensor with its output proportional to the temperature (in °C).With LM35,the temperature can be measured more accurately than with a thermistor. It also possess low self heating and does not cause more than 0.1 °C temperature rise in still air. The operating temperature range is from -55°C to 150°C.The LM35's low output impedance, linear output, and precise inherent calibration make interfacing to readout or control circuitry especially easy. It has find its applications on power supplies, battery management, appliances, etc.

Blood Pressure Sensor:

A pressure sensor is a device for pressure measurement of gases or liquids. Pressure is an expression of the force required to stop a fluid from expanding, and is usually stated in terms of force per unit area. A pressure sensor usually acts as a transducer; it generates a signal as a function of the pressure imposed. For the purposes of this article, such a signal is electrical.

Heart Beat Sensor:

The heartbeat sensor is based on the principle of photo phlethysmography. It measures the change in volume of blood through any organ of the body which causes a change in the light intensity through that organ (a vascular region). In case of applications where heart pulse rate is to be monitored, the timing of the pulses is more important. The flow of blood volume is decided by the rate of heart pulses and since light is absorbed by blood, the signal pulses are equivalent to the heart beat pulses.

Global Positioning System:

A Global Positioning System, also known as GPS, is a system designed to help navigate on the Earth. It may also show how fast it is moving, which direction it is going, how high it is, and maybe how fast it is going up or down. Many GPS receivers have information about places. GPSs for automobiles have travel data like road maps, hotels, restaurants, and service stations. GPSs for boats contain nautical charts of harbors, marinas, shallow water, rocks, and waterways. Other GPS receivers are made for air navigation, hiking and backpacking, bicycling, or many other activities. The majority are in smartphones. Most GPS receivers can record where they have been, and help plan a journey. While traveling a planned journey, it predicts the time to the next destination.

Micro Controller:

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board. The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board – you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks out the functions of the micro-controller into a more accessible package.

Server:

A server is a computer program or a device that provides functionality for other programs or devices, called "clients". This architecture is called the client–server model, and a single overall computation is distributed across multiple processes or devices. Servers can provide various functionalities, often called "services", such as sharing data or resources among multiple clients, or performing computation for a client. A single server can serve multiple clients, and a single client can use multiple servers. A client

process may run on the same device or may connect over a network to a server on a different device. Typical servers are database servers, file servers, mail servers, print servers, web servers, game servers, and application servers.

Alert System:

The Emergency Alert System OR Alert System is only a warning system.

Database:

A database is an organized collection of data. A relational database, more restrictively, is a collection of schemas, tables, queries, reports, views, and other elements. Database designers typically organize the data to model aspects of reality in a way that supports processes requiring information, such as (for example) modelling the availability of rooms in hotels in a way that supports finding a hotel with vacancies. A database-management system (DBMS) is a computer-software application that interacts with end-users, other applications, and the database itself to capture and analyze data. A general-purpose DBMS allows the definition, creation, querying, update, and administration of databases. A database is not generally portable across different DBMSs, but different DBMSs can interoperate by using standards such as SQL and ODBC or JDBC to allow a single application to work with more than one DBMS. Computer scientists may classify database-management systems according to the database models that they support; the most popular database systems since the 1980s have all supported the relational model - generally associated with the SQL language.[disputed – discuss]Sometimes a DBMS is loosely referred to as a "database".

VI CONCLUSION

The system proposes a child health tracking framework that can be provides information directly to parents, or person who take care the child. A framework for health systems provides child health monitoring service. By using this framework parents, or person who take care of child can monitor alteration in body temperature, heart rate ,blood pressure and location of child as soon as possible accurately, so they can analyse the physical characteristics of child and also by using EEG(Electroencephalography signals emotions of children's can detected and get decisions properly.

REFERENCE

[1] Krishana Tupe1, Vinod Jandrao2, Sachin Chappe3, Pawankumar Bhusalwad4, Dr.A.V.Turukmane5, "Child Health Care Monitoring Using Sensor Technology" International Research Journal of Engineering and Technology (IRJET), Volume: 04 Issue: 03 | Mar -2017, e-ISSN: 2395 -0056 /© 2017, IRJET

[2] Nina Sevani, "Personal Health Care Framework for Children," 2015 International Conference on Data and Software Engineering 978-1-4673-8430-8/15/ ©2015 IEEE.

[3] A.Darwish, A. E. Hassanien, "Wearable and Implantable Wireless Sensor forHealthcare Monitoring," 2011 Sensors ISSN 1424-8220

[4] Dr. AparnaAshtaputre- Sisode1, "Emotions and Brain Waves", The International Journal of Indian Psychology ISSN 2348-5396 (e) | ISSN: 2349-3429 (p) Volume 3, Issue 2, No.5, DIP: 18.01.076/20160302 ISBN: 978-1-329-87724-5 http://www.ijip.in | January - March, 2016

[5] Book : Pressman, R.S. (2001), "Software n Engineering: A Practitioner's Approach,"McGraw-Hill Higher Education, New York, NY.

[6]https://openhardwarehealthcare.com/bluetooth-heart-rate sensor-arduino/